Wastewater Treatment System (WTS)
Total Reduced Sulfur (TRS) and Hydrogen Sulfide (H_2S)
Estimate of Emissions

Introduction

Bowater Coated and Specialty Papers Division (Bowater) operates a kraft pulp mill in Catawba, South Carolina. The Bowater mill operates under Title V permit 2440-0005 issued by the South Carolina Department of Health and Environmental Control (SCDHEC).

Bowater submitted a Title V renewal application to SCDHEC in March 2004, as required 6-months prior to the September 2004 permit expiration date. SCDHEC may request additional information during review of the renewal application, and Bowater must respond to each request in a timely manner, or risk losing the Title V permit shield.

Background

In March 2005, SCDHEC requested quantification of H_2S and TRS emissions from all sources at the Bowater facility, as well as other information regarding emissions. Bowater provided the requested information to SCDHEC several weeks later.

For most point sources at the Bowater mill, the H_2S and TRS emissions were quantified in the 2001 PSD construction permit application for the new kraft fiberline. These 2001 emission estimates were incorporated in the Title V renewal emission inventory, but were not within the selected print range and therefore not presented. However, the WTS and several other sources did not have any estimated H_2S or TRS emissions.

Available Information

Following the SCDHEC request, Bowater reviewed technical bulletins published by the National Council for Air and Stream Improvement (NCASI) since the 2001 fiberline PSD application, and found limited information regarding H_2S and TRS emissions from WTS in Technical Bulletin 849, published in August 2002.

Section 4.16 and Table 31 in TB 849 (pages 79-82) discuss the limited amount of H_2S and TRS emissions data available for WTS. The two principle WTS sources present in the Bowater WTS are the primary clarifier and aerated stabilization basin (ASB).

Primary Clarifier Emissions

As indicated by TB 849, the TRS from the primary clarifier is strongly related to whether the mill has a steam stripper. The Bowater mill has a new steam stripper permitted in 1999. Therefore, a small amount of TRS would be expected from the Bowater clarifier.

Table 31 of TB 849 (page 82) indicates the TRS emissions from two clarifiers are 0.0145 and 0.987 lb/ADTP. Page 81 states the clarifier having higher emissions was tested before the mill installed a steam stripper, and emissions are now expected to be significantly lower.

An emission factor of 0.1 lb/ADTP was selected for the Bowater primary clarifier. This represents TRS emissions approximately 90% lower than those from a mill without a steam stripper. This emission factor is more than five times higher than the other clarifier sampled, and five times lower than the average of the two factors available.

ASB Emissions

The TRS emissions measured from several ASB's ranged from 0.028 to 0.201 lb/ADTP. An emission factor of 0.2 lb/ADTP was selected for the Bowater ASB. This represents TRS emissions from a mill treating recovered liquor from a spill lagoon (which Bowater does not have) in addition to the normal mill effluent.

WTS Emissions

The total TRS emissions from the Bowater WTS are estimated as 0.3 lb/ADTP, which is the sum of the primary clarifier and ASB emissions. Data from one mill indicates that seven percent of the TRS from the WTS is H_2S (TB 849, page 81).